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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/962,362	10/31/1997	NOBUYUKI KAMBE	2950.08US01	8780
7590 05/27/2005			EXAMINER	
PETER S. DARDI PATTERSON, THUENTE, SKAAR & CHRISTENSON, P. A. 4800 IDS CENTER 80 SOUTH 8TH STREET MINNEAPOLIS, MN 55402-2100			GUHARAY, KARABI	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/962,362

Applicant(s)

KAMBE ET AL.

Examiner

Karabi Guharay

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 20-30 and 32-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 20-30 & 32-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Amendment, filed on 3/15/2005 has been considered and entered.

Amendment of claim 32 overcomes the rejection of claim 33 under 35 U.S.C 112 second paragraph.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, 20-30, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaskie (US 5442254) further in view of Bhargava (US 5455489).

Referring to claims 1, 4, and 5, Jaskie discloses a display (see FIG. 5) comprising phosphor particles (fluorescent layer 53) having an average diameter less than 95 nm (see abstract, 10 nm particles) wherein the particle size is selected to yield light in a desirable portion of the spectrum. Jaskie is silent as to the particular range of phosphor particles. Jaskie teaches, however, that the specification of a desired particle range is within the skill of the art. See col. 7, lines 34-40. It would have been obvious to specify a desired particle range because the specification of a desired particle range is generally recognized to be within the skill of the art. Furthermore Jaskie does not exemplify that phosphor particle comprises metal oxide. However, Bhargava teaches that metal oxide particles such as ZnO (group II-VI, semiconductor), ZnS, and Y₂O₃ (see

col. 2, lines 4-32), are all suitable for quantum contained phosphors, such as desired by Jaskie. It would have been obvious to select ZnO, ZnS, and Y₂O₃, phosphors as disclosed by Bhargava, in the display, as disclosed by Jaskie, because the selection of known materials for a known purpose is within the skill of the art.

Still referring to claims 1, 4, and 5, substituting an average diameter of 5 nm as recited in claim 4, into the narrower range of particle sizes as recited in claim 5, yields a range of particle sizes of from 3 to 7 nm. Now referring to column 6, lines 46-49, Jaskie teaches that yellow light is produced from particles having a size of approximately 5 nm. Jaskie further teaches that the energy of a photon is inversely proportional to wavelength (col. 1, line 52-55), and inversely proportional to the size of the phosphor particle (col. 4, line 40-44). Taking yellow light to be the band from 597 to 577 nm and using the equations provided in column 1, line 52-55, and column 4, line 40-44 yields the yellow phosphor having the size from 5.04 to 4.95 nm, i.e., approximately 5 nm, as disclosed by Jaskie. Similarly, substituting the wavelength range of visible light from 400 to 800 nm, yield a particle distribution of from 4.14 to 5.84 nm, which is within the claimed range from 3 to 7 nm. Consequently, it is the position of the examiner that it would have been obvious to one skilled in the art that the presently claimed range of sizes reads on the teachings of Jaskie.

Referring to claim 6, Jaskie teaches that the light emission follows low velocity electron excitation.

Referring to claims 2, 3, the selection of known materials for a known purpose is generally considered to be within the skill of the art. Bhargava teaches that ZnO (group II-VI, semiconductor), ZnS, and Y₂O₃ (see col. 2, lines 4-32), are all suitable for quantum contained phosphors, such as desired by Jaskie. It would have been obvious

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to select ZnO, ZnS, and Y₂O₃, phosphors as disclosed by Bhargava, in the display, as disclosed by Jaskie, because the selection of known materials for a known purpose is within the skill of the art.

Referring to claims 20, and 21, FED displays conventionally include a plurality of phosphors for generating red, blue, green light (see for example, US 5,225,820 to Clerc, FIG. 6, RGB phosphors 28), and anodes 26 made of transparent ITO (lines 21-22 of column 5 of Clerc).

Referring to claims 22, 23, Jackie discloses a liquid crystal display; see col. 1, line 26; and a partially transparent faceplate (52 of Fig 5).

Claim 24, and 27 are rejected for the same reason as claim 21.

Referring to claim 25, Jackie teaches a focus grid (focus grid 59 of Fig 4).

Claim 28 is rejected for the same reason as claims 20, 21.

Referring to claims 29 & 34, Jackie teaches that the phosphor particles are roughly spherical (see FIG. 2, and col. 6, line 48).

Claim 30 is rejected for the same reason as claim 6.

Referring to claim 26, Jaskie does not disclose an EL display. Bhargava teaches that quantum confined phosphors provide EL displays (see FIG. 15) with higher efficiency (see col. 9, lines 46-67). It would have been obvious to include the quantum-confined phosphors, as disclosed by Jaskie, in the EL display, as disclosed by Bhargava, for higher efficiency.

Claims 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamatani et al. (US 5892999), and further in view of Parker et al. (US 5460701).

Regarding claim 32, Tamatani et al. disclose a display device (lines 1-6 of column 4) comprising a collection of ultra-fine phosphor particle having an average diameter from 1-100 nm (lines 26-36 of column 4). But, Tamatani is silent about the range of the phosphor particles.

However, Parker et al. discloses a method of making nano-size particles having average particle diameter between 30nm- 50nm (lines 25-26 of column 6) having size distribution range within the claimed range (see table 2) which enables rapid production of ultra-fine particles while controlling the particle size.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method of Parker et al. for producing particles of size 30 nm – 50 nm and having desired narrow particle size distribution.

Regarding claim 33, Tamatani et al. disclose that the phosphor particle is a metal compound such as ZnO (line 30 of column 4).

Response to Arguments

Regarding rejection of claims 1-6 and 20-30 under 35 USC 103(a), examiner points out that after the decision of previous appeal, applicant amends claim 1, where instead of “average diameter less than 100nm” amended claim recites “average diameter less than 95nm” which does not effect the rejection of claims presented to the board of Patent Appeals and Interferences and further doesn’t address the issue of arguments.

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Applicant contends that amendment of claim 1 removes any *res judicata* effect from the first Board decision, further contends that applicant decided that an amendment was proper.

However, examiner wants to point out that such amendment of claim 1 does not overcome the rejection of claims 1-6 & 20-30 as presented before. Examiner further points out that response to applicant's arguments are same as presented before.

Regarding claims 32-34 applicant's arguments are not persuasive for the following reasons:

Examiner agrees that Parker discloses nano-structured material and this nano-structured material is produced by agglomeration.

However, Parker clearly points out that agglomeration process produces agglomerate particle having definite diameters (see Fig 10, lines 4-25 of column 5).

Claims 32-34 calls for a particle, thus agglomerate particles produces by Parker's process is definitely a particle which satisfied the claim limitation of "a particle".

Further applicant contends that prior art Table 2, refers crystalline size not the agglomerate size. However, examiner respectfully disagrees. Since Parker clearly indicates that table 2 shows aluminum oxide or zirconium oxide produced by the instant process (lines 63-64 of column), where this instant process produces agglomerate particles (see lines 4 of column 5 - line 26 of column 6), thus Table 2 definitely recites agglomerate size.

Further examiner agrees that agglomerate particles have sizes between 10-100nm, which is much larger than crystalline sizes 1-50nm. However, applicant claims

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particles having average diameter between 15nm-100nm, thus agglomerate particles, which are formed by fusing nano-crystals, have the claimed size.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Contact Information

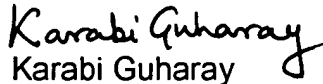
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is (571) 272-2452. The examiner can normally be reached on Monday-Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

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applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Karabi Guharay
Patent Examiner
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